

**THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Appellant(s): Stieger et al.
Appl. No.: 10/538,583
Conf. No.: 9052
Filed: June 15, 2005
Title: NOZZLE ADAPTABLE TO STEAM OUTLET OF A COFFEE MACHINE
Art Unit: 3752
Examiner: James S. Hogan
Docket No.: 3712036-00625

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

Appellants submit this Appeal Brief in support of the Notice of Appeal filed on February 8, 2010. This Appeal is taken from the Final Rejection dated November 16, 2009.

I. REAL PARTY IN INTEREST

The real parties in interest for the above-identified patent application on Appeal are Mischa Stieger and Alfred Yoakim.

II. RELATED APPEALS AND INTERFERENCES

Appellants' legal representative and the Assignee of the above-identified patent application do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision with respect to the above-identified Appeal.

III. STATUS OF CLAIMS

Claims 1 and 3-12 are pending in the above-identified patent application. Claim 2 was previously canceled without prejudice or disclaimer. Claims 1 and 3-12 stand rejected. Therefore, Claims 1 and 3-12 are being appealed in this Brief. A copy of the appealed claims is included in the Claims Appendix.

IV. STATUS OF AMENDMENTS

A Final Office Action was mailed on December 17, 2008, in which the Examiner rejected Claims 1-12 as being obvious. Appellants filed an Amendment After Final on March 17, 2009, in which Appellants amended the claims and argued against the rejection. The Examiner mailed an Advisory Action on April 6, 2009. In response, Appellants filed a Request for Continued Examination on April 21, 2009. The Examiner mailed a Non-Final Office Action on May 11, 2009, in which the Examiner continued to reject Claims 1 and 3-12 as being obvious. Appellants filed a Response to the Non-Final Office Action on August 11, 2009, in which Appellants argued against the obviousness rejections. A Final Office Action was mailed on November 16, 2009, in which the Examiner maintained the obviousness rejections. A Notice of Appeal was filed February 8, 2010. A copy of the Non-Final Office Action dated May 11, 2009, and Final Office Action dated November 16, 2009 are attached as Exhibits A and B, respectively, in the Evidence Appendix.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A summary of the invention by way of reference to the drawings and specification for each of the independent claims and each means plus function claim may be found in Appendix B to this Brief.

Independent Claim 1 recites, in part, a nozzle that can be fitted onto a steam outlet of a coffee machine intended to froth a liquid, the nozzle comprising a mouth for receiving the steam (page 1, line 22-page 2, line 2), a restriction in a continuation of the mouth (page 1, line 22-page 2, line 2), a flared zone along the axis of the restriction and of the mouth to allow the liquid out (page 1, line 22-page 2, line 2; page 2, lines 23-30), having a cross section approximately equal to the cross section of the mouth, approximately perpendicular to the mouth, an inlet pipe for allowing in liquid (page 1, line 22-page 2, line 2; page 2, lines 23-30), and an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe (page 1, line 22-page 2, line 2), wherein the nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use (page 1, line 22-page 2, line 2; page 4, lines 23-32).

Independent Claim 11 recites, in part, a nozzle for a steam outlet of a coffee machine comprising a mouth for receiving the steam, a restriction in the mouth (page 1, line 22-page 2, line 2), a flared zone along the axis of the restriction and of the mouth (page 1, line 22-page 2, line 2; page 2, lines 23-30), the flared zone having a cross section approximately equal to the cross section of the mouth, extending at an angle from the mouth an inlet pipe for allowing in liquid (page 1, line 22-page 2, line 2; page 2, lines 23-30), and an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe (page 1, line 22-page 2, line 2), wherein the nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use (page 1, line 22-page 2, line 2; page 4, lines 23-32).

Although specification citations are given in accordance with C.F.R. 1.192(c), these reference numerals and citations are merely examples of where support may be found in the specification for the terms used in this section of the Brief. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification. As demonstrated by the references numerals and citations below, the claims are fully supported by

the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. Pointing out specification support for the claim terminology as is done here to comply with rule 1.192(c) does not in any way limit the scope of the claims to those examples from which they find support. Nor does this exercise provide a mechanism for circumventing the law precluding reading limitations into the claims from the specification. In short, the references numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1 and 3-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,499,389 to Probst ("*Probst*") in view of U.S. Patent No. 5,768,981 to Cicchetti ("*Cicchetti*"). Copies of *Probst* and *Cicchetti* are attached herewith as Exhibits C and D in the Evidence Appendix.

VII. ARGUMENT

A. LEGAL STANDARDS

Obviousness under 35 U.S.C. § 103

The Federal Circuit has held that the legal determination of an obviousness rejection under 35 U.S.C. § 103 is:

whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made...The foundational facts for the *prima facie* case of obviousness are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claimed invention; and (3) the level of ordinary skill in the art...Moreover, objective indicia such as commercial success and long felt need are relevant to the determination of obviousness...Thus, each obviousness determination rests on its own facts.

In re Mayne, 41 U.S.P.Q. 2d 1451, 1453 (Fed. Cir. 1997).

In making this determination, the Patent Office has the initial burden of proving a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q. 2d 1955, 1956 (Fed. Cir. 1993). This burden may only be overcome “by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings.” *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). “If the examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of the patent.” *In re Oetiker*, 24 U.S.P.Q. 2d 1443, 1444 (Fed. Cir. 1992).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference or references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Fine*, 837 F.2d 1071, 5, U.S.P.Q.2d 1596 (Fed. Cir. 1988). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Finally, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q., 580 (CCPA 1974).

Further, the Federal Circuit has held that it is “impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the

claimed invention is rendered obvious.” *In re Fritch*, 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992). “One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.” *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

Moreover, the Federal Circuit has held that “obvious to try” is not the proper standard under 35 U.S.C. §103. *Ex parte Goldgaber*, 41 U.S.P.Q.2d 1172, 1177 (Fed. Cir. 1996). “An-obvious-to-try situation exists when a general disclosure may pique the scientist curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.” *In re Eli Lilly and Co.*, 14 U.S.P.Q.2d 1741, 1743 (Fed. Cir. 1990).

Of course, references must be considered as a whole and those portions teaching against or away from the claimed invention must be considered. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc.*, 796 F.2d 443 (Fed. Cir. 1986). “A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the Applicant.” *Monarch Knitting Machinery Corp. v. Fukuhara Industrial Trading Co., Ltd.*, 139 F.3d 1009 (Fed. Cir. 1998), quoting, *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994).

B. THE CLAIMED INVENTION

Independent Claim 1 is directed to a nozzle that can be fitted onto a steam outlet of a coffee machine intended to froth a liquid. The nozzle includes a mouth for receiving the steam, a restriction in a continuation of the mouth, a flared zone along the axis of the restriction and of the mouth to allow the liquid out, an inlet pipe for allowing in liquid, and an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe. The flared zone has a cross section approximately equal to the cross section of the mouth, approximately perpendicular to the mouth. The nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use.

Independent Claim 11 recites, in part, a nozzle for a steam outlet of a coffee machine. The nozzle includes a mouth for receiving the steam, a restriction in the mouth, a flared zone

along the axis of the restriction and of the mouth, an inlet pipe for allowing in liquid, and an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe. The flared zone has a cross section approximately equal to the cross section of the mouth, extending at an angle from the mouth the inlet pipe. The nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use.

C. THE REJECTION OF CLAIMS 1 AND 3-12 UNDER 35 U.S.C. §103(a) SHOULD BE REVERSED BECAUSE THE EXAMINER HAS FAILED TO ESTABLISH A *PRIMA FACIE* CASE OF OBVIOUSNESS

Appellants respectfully submit that the obviousness rejection of Claims 1 and 3-12 should be reversed because the Examiner has failed to establish a *prima facie* case of obviousness. In the Final Office Action, the Examiner asserts that the combination of *Probst* and *Cicchetti* renders the claimed subject matter obvious. See, Final Office Action, pages 3-5. However, the Examiner has failed to establish a *prima facie* case of obviousness for several reasons. For example, the cited references fail to disclose each and every element of the present claims, and there exists no reason why the skilled artisan would have combined *Probst* and *Cicchetti* to arrive at the presently claimed subject matter.

1. The Cited References Fail to Disclose Each and Every Element of the Present Claims

Independent Claims 1 and 11 recite, in part, a nozzle comprising a mouth for receiving steam, a restriction in a continuation of the mouth, a flared zone along the axis of the restriction and of the mouth to allow the liquid out, an inlet pipe for allowing in liquid, and an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe, wherein the nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use. By forming the nozzle in one piece rather than separate parts, the device does not contain regions adjoining parts where milk might be deposited during non-use. See, specification, page 3, lines 1-9. In addition,

because the user cannot merely disassemble the parts to clean them, the user must dispose of the nozzle after a few uses, thereby ensuring good hygiene. See, specification, page 2, lines 11-14. In contrast, the cited references fail to disclose every element of the present claims.

For example, the cited references fail to disclose or suggest a nozzle configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use. The Examiner admits that *Probst* fails to disclose that its nozzle is configured in one piece and instead relies on *Cicchetti* for disclosure of the claimed element. See, Non-Final Office Action, page 3, lines 4-9. Specifically, the Examiner asserts that *Cicchetti* discloses “a mostly-one piece (25) housing [including] a mouth (15), outlet (20) and perpendicular milk inlet (17).” See, Non-Final Office Action, page 3, lines 6-7. However, Appellants note that the present claims do not recite a nozzle configured “mostly” in one piece but rather a nozzle configured in “one piece formed from an assembly of two injection-molded welded plastic shells.” By forming the nozzle in one piece rather than “mostly in one piece,” the device of the present claims eliminates regions adjoining parts where milk might be deposited during non-use, thus ensuring good hygiene. See, specification, page 3, lines 1-9.

Contrary to the Examiner’s assertion, *Cicchetti* is entirely directed to a steam heating device having several separate and disconnectable parts. See, *Cicchetti*, column 1, lines 57-67; column 2, lines 1-7 and 14-40. For example, *Cicchetti* expressly states that “as clearly viewed from the figures, the described device can be easily disassembled should a thorough cleaning be required.” See, *Cicchetti*, column 2, lines 51-53. *Cicchetti* further teaches that its steam heating device 10 includes a dispenser 27 axially disposed within a duct 25. See, *Cicchetti*, column 2, lines 14-17. The “duct 25 and dispenser 27 are axially slidable relative to each other.” See, *Cicchetti*, column 2, lines 23-24. These passages clearly show that the duct 25 and dispenser 27 are separate parts and cannot be formed as a single piece. In addition, *Cicchetti* discloses that “the valve unit 19 together with the starting portion of duct 17 [] can be bayonet-disconnected from body 29.” See, *Cicchetti*, column 2, lines 37-39. As such, Appellants respectfully submit that *Cicchetti* is entirely directed to a steam heating device including several disconnectable parts and fails to disclose a nozzle configured in one piece as required, in part, by the present claims.

The Examiner asserts that the duct (25) of *Cicchetti* is a nozzle configured in one piece in accordance with the present claims. See, Non-Final Office Action, page 3, lines 6-7. However, Appellants respectfully submit that the “nozzle” of *Cicchetti* should be the entire device (10),

rather than the duct (25). For example, the present claims require a nozzle which includes a mouth for receiving steam, a restriction in a continuation of the mouth, a flared zone along the axis of the restriction and of the mouth to allow the liquid out, an inlet pipe for allowing in liquid, and an air intake formed directly on the inlet pipe. In contrast, the component (25) of *Cicchetti* is merely a duct which extends rearwardly of the body (29) and is part of the delivery outlet of the steam heating device. See, *Cicchetti*, column 2, lines 14-17 and 29-32; Fig. 1.

Furthermore, Appellants respectfully submit that the duct (25) of *Cicchetti* is not a nozzle configured in one piece and formed from an assembly of two injection-molded welded plastic shells as recited, in part, by independent Claims 1 and 11. Instead, the mouth for receiving steam (12) and the steam chamber (15) are formed as parts of the body (29), which is separable from duct (25). See, *Cicchetti*, column 2, lines 29-36 and 51-56; Fig. 1. Furthermore, the liquid inlet (13) and air inlet (14) are removably mounted onto the body (29). See, *Cicchetti*, column 2, lines 33-40; Fig. 1 (“[d]ucts 12 and 13 and the valve unit 19 project from the casing 30 through a side slit 31. The actuator body is snap-fastened to the casing 30 by means of locking tabs. . . the valve unit 19 together with the starting portion of duct 17 90 can be bayonet-disconnected from body 29”). Nowhere does *Cicchetti* disclose or suggest that its duct (25) is configured in one piece and formed from an assembly of two injection-molded welded plastic shells, nor does the Examiner cite support for such claimed elements.

Cicchetti is entirely directed to a steam heating device which solves the prior art problems of sterilization by including “drivingly slidable blocking members for closing the delivery outlet, so that an inner-cleaning cycle may be performed on operation of the steam circulation.” See, *Cicchetti*, column 1, lines 17-34. Nowhere does *Cicchetti* teach solving the sterilization problems by eliminating the regions adjoining parts and providing the nozzle as a single piece. To the contrary, *Cicchetti* teaches a device having several “individual components” which “can be easily disassembled should a thorough cleaning be required.” See, *Cicchetti*, column 2, lines 51-56; Fig. 1. As such, Appellants respectfully submit that *Cicchetti* fails to disclose a nozzle configured in one piece as required, in part, by the present claims.

Consequently, *Probst* and *Cicchetti* alone, or in combination, fail to disclose or suggest each and every element of the present claims.

Accordingly, Appellants respectfully request that the obviousness rejection of Claims 1 and 3-12 be reconsidered and withdrawn.

3. The Skilled Artisan Would Have No Reason to Combine the Cited References to Arrive at the Present Claims

Appellants also respectfully submit that the skilled artisan would have no reason to combine the cited references to arrive at the present claims. Indeed, configuring the nozzles of *Probst* or *Cicchetti* into one piece would not have been obvious to one of ordinary skill in the art at the time of the present invention. For example, *Probst* teaches that better cleaning can be achieved by using multiple individual elements. See, *Probst*, column 3, lines 43-46; column 4, lines 63-65 (“[f]or cleaning purposes, the element 2 and the additional element 18 are detachably held together by a sleeve”). Similarly, *Cicchetti* teaches disassembling the multiple individual components of its device for thorough cleaning. See, *Cicchetti*, column 2, lines 51-56; Fig. 1. By using multiple parts, prior art nozzles such as *Probst* and *Cicchetti* include regions where milk can be deposited and thus lead to bacterial contamination. See, specification, page 3, lines 1-9. The individual parts must therefore be disassembled in order to clean the nozzle, as clearly taught by *Cicchetti*. See, specification, page 1, lines 5-16.

In direct contrast, the nozzle of the present claims is formed as a single piece whose parts cannot be disconnected in order to force the user to dispose of the nozzle after a few uses, rather than disassembling the parts to clean the nozzle. See, specification, page 2, lines 11-14; page 3, lines 1-9. . Nowhere do the cited references suggest that their nozzles may be formed in one piece or that doing so would be more hygienic. Instead, the references merely teach that better cleaning may be achieved by disassembling the multiple components. See, *Cicchetti*, column 2, lines 51-56. Thus, the cited references fail to disclose or even suggest a nozzle configured in one piece formed from an assembly of two injection-molded welded plastic shells in accordance with the present claims.

Appellants respectfully submit that what the Examiner has done here is to apply hindsight reasoning by attempting to selectively piece together teachings of each of the references in an attempt to recreate what the claimed invention discloses, and that the skilled artisan must have a reason to combine the cited references to arrive at the present claims. Appellants respectfully submit that such a reason is not present in the instant case. For at least the reasons discussed

above, Appellants respectfully submit that the cited references, alone or in combination, are deficient with respect to the present claims.

Accordingly, Appellants respectfully request that the obviousness rejection of Claims 1 and 3-12 be reconsidered and withdrawn.

VIII. CONCLUSION

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a) with respect to the rejections of Claims 1 and 3-12. Accordingly, Appellants respectfully submit that the obviousness rejections are erroneous in law and in fact and should, therefore, be reversed by this Board.

The Director is authorized to charge \$540 for the Appeal Brief and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036-00625 on the account statement.

Respectfully submitted,

K&L GATES LLP

BY 

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Dated: April 8, 2010

CLAIMS APPENDIX

PENDING CLAIMS ON APPEAL OF U.S. PATENT APPLICATION SERIAL NO. 10/538,583

1. A nozzle that can be fitted onto a steam outlet of a coffee machine intended to froth a liquid, the nozzle comprising
a mouth for receiving the steam,
a restriction in a continuation of the mouth,
a flared zone along the axis of the restriction and of the mouth to allow the liquid out, having a cross section approximately equal to the cross section of the mouth,
approximately perpendicular to the mouth, an inlet pipe for allowing in liquid, and
an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe, wherein the nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use.

3. The nozzle as claimed in claim 1, wherein the air intake comprises a pipe which opens into the inlet pipe at approximately right angles.

4. The nozzle as claimed in claim 1, wherein the pipe allows a tube to be fitted for drawing up said liquid.

5. The nozzle as claimed in claim 1, wherein the flared zone comprises a means for breaking a jet of liquid.

6. The nozzle as claimed in claim 1, wherein the flared zone comprises a stabilizing zone at its outlet.

7. The nozzle as claimed in claim 1, wherein the nozzle is injection-molded from a plastic compatible with food use.

8. The nozzle as claimed in claim 1, wherein the air intake and the inlet pipe have an inside diameter of 1 to 3 mm and the mouth has an inside diameter of 10 to 15 mm.

9. The nozzle as claimed in claim 1, wherein the restriction and the stabilizing zone have a diameter of 2 to 4 mm.

10. The nozzle as claimed in claim 1, wherein the stabilizing zone is a cylindrical part about 4 to 20 mm high.

11. A nozzle for a steam outlet of a coffee machine comprising:
a mouth for receiving the steam,
a restriction in the mouth,
a flared zone along the axis of the restriction and of the mouth, the flared zone having a cross section approximately equal to the cross section of the mouth,
extending at an angle from the mouth an inlet pipe for allowing in liquid, and
an air intake formed directly on the inlet pipe as a hole, a slit or a pipe which opens into the inlet pipe, wherein the nozzle is disposable and configured in one piece formed from an assembly of two injection-molded welded plastic shells that are compatible with food use.

12. The nozzle of Claim 1, wherein the shells are made of propylene.

EVIDENCE APPENDIX

EXHIBIT A: Non-Final Office Action mailed May 11, 2009

EXHIBIT B: Final Office Action mailed November 16, 2009

EXHIBIT C: U.S. Patent No. 6,499,389 to Probst et al. ("*Probst*")

EXHIBIT D: U.S. Patent No. 5,768,981 to Cicchetti ("*Cicchetti*")

RELATED PROCEEDINGS APPENDIX

None.

EXHIBIT A



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------------|-----------------------------|
| 10/538,583 | 06/15/2005 | Mischa Stieger | 112701-625 | 9052 |
| 29157 | 7590 | 05/11/2009 | | |
| K&L Gates LLP P.O. Box 1135 CHICAGO, IL 60690 | | | EXAMINER HOGAN, JAMES SEAN | |
| | | | ART UNIT 3752 | PAPER NUMBER |
| | | | NOTIFICATION DATE 05/11/2009 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

| | | | |
|------------------------------|-------------------------------|--------------------------------|--|
| Office Action Summary | Application No. 10/538,583 | Applicant(s) STIEGER ET AL. | |
| | Examiner JAMES S. HOGAN | Art Unit 3752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed March 17, 2009 have been fully considered but they are not persuasive. The Examiner maintains that due to sanitation rules such as NSF Standards 2, 8, and 18, it would be in the Applicant's best interest to include approved materials for the construction of devices falling within the criterion set forth by said standards. Included within those standards may or may not include standards by which an item may be disposable as well. Therefore, the instance that the nozzle be disposable and the use of plastics that are compatible to food use are known strategies for qualifying an apparatus for sanitation qualifications and therefore are not qualifying for a patented claim. However, in light of Applicant's arguments, as filed, a secondary reference has been obtained

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,499,389 to Probst in view of U.S. Patent No. 5,768,981 to Cicchetti

3. As per claims 1, 11 and 12, Probst discloses a nozzle that can be fitted onto the steam outlet (4) of a coffee machine intended to froth a liquid, the nozzle having a mouth (at (3)) for receiving letting in steam, a restriction (3a) in a continuation of the

Art Unit: 3752

said mouth, and a flared zone(13) along the axis of the said restriction and of the said mouth to allow the liquid out, having a cross section more or less approximately equal to the cross section of the mouth, and a pipe (6) perpendicular to the mouth for allowing in liquid, and an air inlet (8), the air inlet extending from the pipe at an angle of 0°. Probst does not necessarily show the nozzle being made of one piece, nor the material it is made of, however, Cicchetti teaches a mostly-one piece (25) housing of a mouth (15), outlet (20) and perpendicular milk inlet (17). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Probst with a unitary housing as suggested by Cicchetti. Doing so would provide a unitary construction capable of being disposable and because (a) the Probst reference and the Cicchetti reference are *known work in one of field of endeavor*, (b) such modification is merely the use of known technique to improve a similar device by Applicant and (c) such modification, i.e. choosing from a finite number of predictable solutions, is not of innovation but of ordinary skill and common sense. *KSR, International Co. v. Teleflex Inc.*, 550 U.S. (2007). Similarly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have proclaimed a compatible material for the nozzle, (i.e. food grade plastic, e.g. propylene), since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *in re Leshin*, 125 USPQ 416. Further, as Probst and Cicchetti do not teach a disposable nozzle piece, doing so is know to be making a piece “portable”, and it has been held that making an old device portable or movable without producing any new and expected

results involves only routine skill in the art. See *In re Lindberg*, 93 USPQ 23 (CCPA 1952).

4. As per claim 2, the air inlet of Probst is shown (See Figure 1) as part of the pipe.
5. As per claim 3, the air inlet of Probst, as best as can be determined, opens at a right angle.
6. As per claim 5, the flared zone of Probst is taught to be an emulsifying chamber which by definition would break a jet.
7. As per claim 6, as best as can be determined, a blind ring (17) and settling segment (16) cooperate to create a stabilizing zone at the outlet of Probst.
8. As per claim 7, neither Probst nor Cicchetti teach a specific material for the nozzle, however it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen a desired material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *in re Leshin*, 125 USPQ 416.

As per claims 8-10, neither Probst nor Cicchetti teach specific sizes for any one piece of the nozzle assembly, however, it would have been obvious to one with ordinary skill in the art at the time the invention was made to utilize 1-3 mm for the air inlet, 10 to 15 mm for the mouth and 2 to 4mm for the restriction, and 4-20 mm for a stabilization zone, since our reviewing courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the

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prior art device, the claimed device was not patentably distinct from the prior art device.

Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert.

denied, 469 U.S. 830, 225 USPQ 232 (1984).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES S. HOGAN whose telephone number is (571)272-4902. The examiner can normally be reached on Mon-Fri, 6:00a-3:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. H./

Application/Control Number: 10/538,583

Page 6

Art Unit: 3752

Examiner, Art Unit 3752

/Len Tran/

Supervisory Patent Examiner, Art Unit 3752

| | | | |
|-----------------------------------|---------------------------------------|--|-------------|
| Notice of References Cited | Application/Control No. 10/538,583 | Applicant(s)/Patent Under Reexamination STIEGER ET AL. | |
| | Examiner JAMES S. HOGAN | Art Unit 3752 | Page 1 of 1 |

U.S. PATENT DOCUMENTS

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | Classification |
|---|---|--|-----------------|-------------------|----------------|
| * | A | US-5,768,981 | 06-1998 | Cicchetti, Pietro | 99/453 |
| | B | US- | | | |
| | C | US- | | | |
| | D | US- | | | |
| | E | US- | | | |
| | F | US- | | | |
| | G | US- | | | |
| | H | US- | | | |
| | I | US- | | | |
| | J | US- | | | |
| | K | US- | | | |
| | L | US- | | | |
| | M | US- | | | |

FOREIGN PATENT DOCUMENTS

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Country | Name | Classification |
|---|---|--|-----------------|---------|------|----------------|
| | N | | | | | |
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| | Q | | | | | |
| | R | | | | | |
| | S | | | | | |
| | T | | | | | |

NON-PATENT DOCUMENTS

| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
|---|---|---|
| | U | |
| | V | |
| | W | |
| | X | |

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EXHIBIT B



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------------|-----------------------------|
| 10/538,583 | 06/15/2005 | Mischa Stieger | 112701-625 | 9052 |
| 29157 | 7590 | 11/16/2009 | | |
| K&L Gates LLP P.O. Box 1135 CHICAGO, IL 60690 | | | EXAMINER HOGAN, JAMES SEAN | |
| | | | ART UNIT 3752 | PAPER NUMBER |
| | | | NOTIFICATION DATE 11/16/2009 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/538,583 | Applicant(s) STIEGER ET AL. | |
| | Examiner JAMES S. HOGAN | Art Unit 3752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed August 11, 2009 have been fully considered but they are not persuasive. The Examiner has stated in earlier actions that sanitation rules such as NSF Standards 2, 8, and 18, it would be in the Applicant's best interest to included approved materials for the construction of devices falling within the criterion set forth by said standards. Furthermore, as the prior art teachings of Cicchetti address the problem of cleaning parts that may become contaminated, it can only be of a an extension of reasonable logic to extend this thinking to a one piece disposable nozzle, as claimed. And as 35 U.S.C. 103(a) fully addresses the design intention to combine many pieces into a single piece (i.e. to make integral) any further process to make a piece disposable is an extension of common sense, as just about every manufactured good has a lifespan that requires eventual disposal or recycling. Therefore, the instance that the nozzle be disposable and the use of plastics that are compatible to food use are known strategies for qualifying an apparatus for sanitation qualifications and therefore are not qualifying for a patented claim.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,499,389 to Probst in view of U.S. Patent No. 5,768,981 to Cicchetti

3. As per claims 1,11 and 12, Probst discloses a nozzle that can be fitted onto the steam outlet (4) of a coffee machine intended to froth a liquid, the nozzle having a mouth (at (3))for receiving letting in steam, a restriction (3a) in a continuation of the said mouth, and a flared zone(13) along the axis of the said restriction and of the said mouth to allow the liquid out, having a cross section more or less approximately equal to the cross section of the mouth, and a pipe (6) perpendicular to the mouth for allowing in liquid, and an air inlet (8), the air inlet extending from the pipe at an angle of 0°. Probst does not necessarily show the nozzle being made of one piece, nor the material it is made of, however, Cicchetti teaches a mostly-one piece (25) housing of a mouth (15), outlet (20) and perpendicular milk inlet (17). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Probst with a unitary housing as suggested by Cicchetti. Doing so would provide a unitary construction capable of being disposable and because (a) the Probst reference and the Cicchetti reference are *known work in one of field of endeavor*, (b) such modification is merely the use of known technique to improve a similar device by Applicant and (c) such modification, i.e. choosing from a finite number of predictable solutions, is not of innovation but of ordinary skill and common sense. *KSR, International Co. v. Teleflex Inc.*, 550 U.S. (2007). Similarly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have proclaimed a compatible material for the nozzle, (i.e. food grade plastic, e.g. propylene), since it has been held to be

Art Unit: 3752

within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *in re Leshin*, 125 USPQ 416. Further, as Probst and Cicchetti do not teach a disposable nozzle piece, doing so is known to be making a piece "portable", and it has been held that making an old device portable or movable without producing any new and expected results involves only routine skill in the art. See *In re Lindberg*, 93 USPQ 23 (CCPA 1952).

4. As per claim 2, the air inlet of Probst is shown (See Figure 1) as part of the pipe.
5. As per claim 3, the air inlet of Probst, as best as can be determined, opens at a right angle.
6. As per claim 5, the flared zone of Probst is taught to be an emulsifying chamber which by definition would break a jet.
7. As per claim 6, as best as can be determined, a blind ring (17) and settling segment (16) cooperate to create a stabilizing zone at the outlet of Probst.
8. As per claim 7, neither Probst nor Cicchetti teach a specific material for the nozzle, however it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen a desired material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *in re Leshin*, 125 USPQ 416.

As per claims 8-10, neither Probst nor Cicchetti teach specific sizes for any one piece of the nozzle assembly, however, it would have been obvious to one with ordinary

Art Unit: 3752

skill in the art at the time the invention was made to utilize 1-3 mm for the air inlet, 10 to 15 mm for the mouth and 2 to 4mm for the restriction, and 4-20 mm for a stabilization zone, since our reviewing courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES S. HOGAN whose telephone number is (571)272-4902. The examiner can normally be reached on Mon-Fri, 6:00a-3:00p EST.

Art Unit: 3752

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/J. S. H./

Examiner, Art Unit 3752

/Len Tran/

Supervisory Patent Examiner, Art Unit 3752

EXHIBIT C



US006499389B1

(12) **United States Patent**
Probst

(10) **Patent No.:** **US 6,499,389 B1**
(45) **Date of Patent:** **Dec. 31, 2002**

(54) **DEVICE FOR PRODUCING MILK FROTH FOR CAPPUCCINO**

5,295,431 A * 3/1994 Schiettecatté et al. 99/293
5,738,002 A * 4/1998 Marano-Ducarne 99/293

(75) **Inventor:** Emanuel Probst, Zürich (CH)

(73) **Assignee:** Jura Elektroapparate AG,
Niederbuchsiten

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/787,803

(22) **PCT Filed:** Sep. 22, 1999

(86) **PCT No.:** PCT/EP99/07047

§ 371 (c)(1),

(2), (4) **Date:** Mar. 23, 2001

(87) **PCT Pub. No.:** WO00/16674

PCT Pub. Date: Mar. 30, 2000

(30) **Foreign Application Priority Data**

Sep. 24, 1998 (DE) 298 17 116 U

(51) **Int. Cl.⁷** A47J 31/44

(52) **U.S. Cl.** 99/323.1; 261/DIG. 16;
261/DIG. 76

(58) **Field of Search** 99/323.1, 293,
99/279, 300, 287; 261/DIG. 16, DIG. 76

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,265,519 A 11/1993 Schiettecatté et al. 99/293

FOREIGN PATENT DOCUMENTS

| | | |
|----|--------------|---------|
| DE | 89 07 183 U | 7/1989 |
| DE | 197 05 633 A | 8/1998 |
| EP | 0 344 859 A | 12/1989 |
| EP | 0 801 922 A | 10/1997 |
| EP | 0 858 757 A | 8/1998 |

* cited by examiner

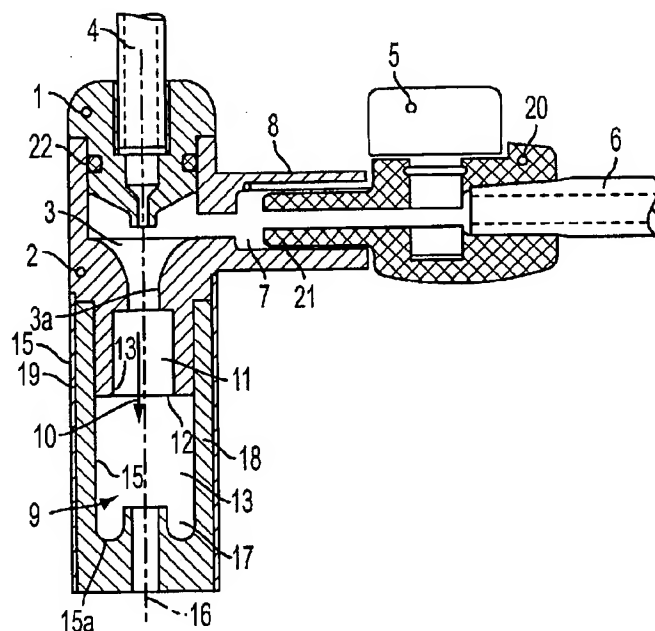
Primary Examiner—Reginald L. Alexander

(74) *Attorney, Agent, or Firm*—Venable; Norman N. Kunitz

(57) ABSTRACT

A device for producing milk froth for cappuccino, having a nozzle arrangement (1,2) that is disposed downstream of a steam pipe (4) and has a vacuum chamber (3), into which a milk supply line (6) terminates, and with an air conduit (8) connected to the milk supply line (6) upstream of the vacuum chamber (3). An emulsifying chamber (9) is disposed downstream of the vacuum chamber (3), with the emulsifying chamber having a chamber wall, a floor with a central, flow-diverting protrusion and an outlet. A settling segment (16) adjoins the outlet. For the fine-pored emulsification of milk froth with the device, the emulsifying chamber (9,23,32), which is embodied without separate air inlets, has at least two free cross sections that widen stepwise in the primary flow direction (10). The central, flow-diverting protrusion is embodied as a flow trap surrounding the outlet in the floor such that the protrusion diverts a mixture essentially to a direction flowing in the primary flow direction essentially counter to the primary flow direction.

11 Claims, 2 Drawing Sheets



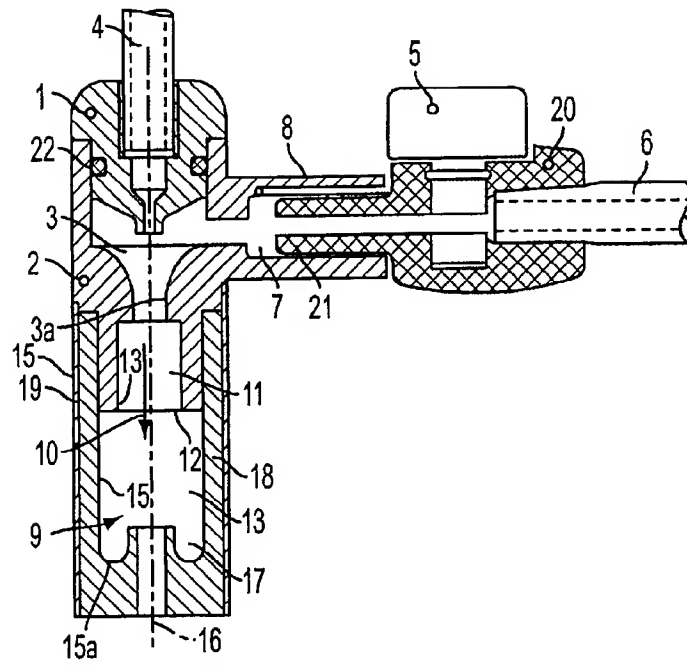


FIG. 1

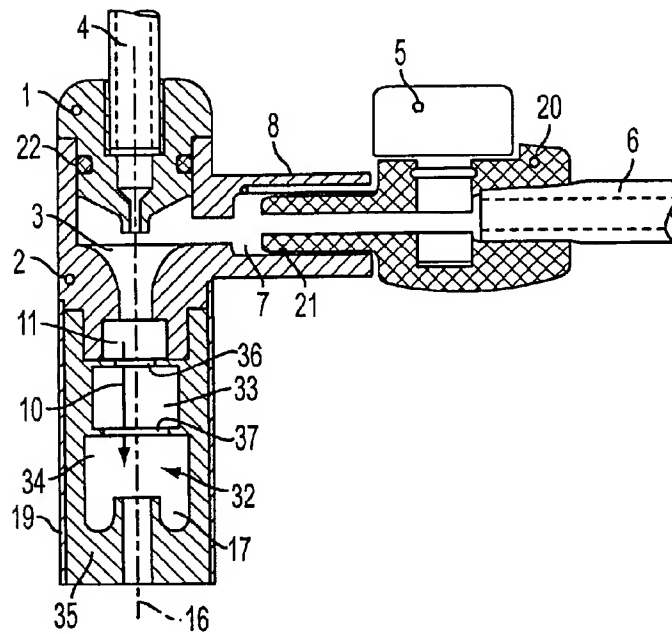


FIG. 4

1

DEVICE FOR PRODUCING MILK FROTH FOR CAPPUCCINO

BACKGROUND OF THE INVENTION

The invention relates to a device for producing milk froth for cappuccino. More particularly, the present invention relates to a device for producing milk froth for cappuccino, having a nozzle arrangement that is disposed downstream of a steam pipe and that has a vacuum chamber into which a milk supply line terminates, an air conduit connected to the milk supply line upstream of the vacuum chamber, an emulsifying chamber, having a chamber wall, a floor with a central, flow-diverting protrusion and an outlet, disposed downstream of the vacuum chamber, and a settling segment adjoining the outlet.

In a known device of this type for producing a creamy steam-milk-air emulsion for preparing cappuccino, a milk supply line, which has an air opening that is connected to the atmosphere (U.S. Pat. No. 5,265,519), terminates into a vacuum chamber disposed downstream of a steam pipe having a nozzle. The steam-milk-air mixture produced in the vacuum chamber flows out of the vacuum chamber and into an emulsifying chamber having a closed floor with an essentially conical protrusion. The mixture flowing out of the vacuum chamber, against the central protrusion on the floor of the emulsifying chamber, is divided by the protrusion and reshaped into a new, large-surface mixture flow that impacts the floor of the side wall of the emulsifying chamber and is intended to mix thoroughly with a portion of the mixture already present in the emulsifying chamber to form a good emulsion. This process is supposed to produce a creamy mixture of fine froth that exits through a side opening of the emulsifying chamber and, from there, can flow into a further, cylindrical chamber located to the side of the emulsifying chamber. There, the emulsion settles while excess steam can escape through an upper opening of the additional chamber. This device has yet to achieve its objectives.

For more thoroughly premixing the milk suctioned into the vacuum chamber with air, it is already known to provide a premixing chamber between the vacuum chamber and the milk supply line, with the air conduit terminating into the premixing chamber (EP 0 858 757 A1). While this arrangement produces an extensively homogeneous steam-milk-air mixture in the vacuum chamber, the mixture can still be too large-pored.

Also known from the state of the technology is a device for frothing and heating liquids such as milk or the like. This device is equipped with longitudinal conduits for suctioning froth-producing air around a settling chamber having a relatively large cross section and a long length (EP 0 813 834 A1). In this device, first only the suctioned milk is mixed with steam in the vacuum chamber for pre-frothing. For producing the desired froth, the mixture is conducted into an acceleration segment that adjoins the vacuum chamber downstream, and is provided with openings that are connected to the air-conducting longitudinal conduits. The milk and froth are allowed to settle, and be homogeneously distributed, in the cylindrical chamber having the relatively large diameter and long length. This setup does not automatically achieve the desired fine-pore quality desired in many cases, however.

In a similar device, a second nozzle arrangement adjoins the vacuum chamber of the first nozzle arrangement. The second arrangement has air-intake openings that are more

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directly connected to the atmosphere than the openings connected via longitudinal conduits in the aforementioned arrangement (EP 0344 859 B1). In the second nozzle arrangement, air is suctioned and added to the milk to produce froth, which is then suctioned with the first nozzle arrangement. The froth flows out of a chamber that adjoins the second nozzle arrangement, the chamber having a relatively large diameter and long length, through lower, notably lateral, openings in the chamber, and consequently settles and is uniformly distributed. The floor of this chamber is shaped so as to prevent the froth from exiting directly at a high speed. For this purpose, the floor has a rounded protrusion. The floor has individual drip openings near the edge. This device also does not attain the desired fine-pored, homogeneously emulsified steam-milk-air mixture.

SUMMARY OF THE INVENTION

It is the object of the present invention to create a device for producing milk froth for cappuccino, with which the milk froth is homogeneously emulsified and fine-pored.

The above object generally is achieved according to the present invention with a device of the generic type described at the outset, wherein the emulsifying chamber, which is formed without separate air inlets, has at least two free cross sections that widen step-wise in the primary flow direction, and the central, flow-diverting protrusion is formed as a flow trap that surrounds the outlet in the floor such that the protrusion diverts a mixture flowing essentially in the primary flow direction essentially to a direction counter to the primary flow direction. Also disclosed are variations of the basic solution. The basic solution and variations thereof are based on the common principle that the steam-milk-air mixture formed in the vacuum chamber after the premixing of the milk with air is mixed intensively again, and swirled, in the emulsifying chamber. The mixture remains in the emulsifying chamber as long as possible, where it is emulsified into a fine-pored mixture due to the continuous flow of steam energy.

According to the basic solution, the cross sections of the emulsifying chamber, which increase step-wise in the downstream direction, strongly swirl the steam-milk-air mixture in the emulsifying chamber. The central, flow-diverting protrusion around the outlet in the floor of the emulsifying chamber, which is embodied as a flow trap, lengthens the time spent by the steam-milk-air mixture in the emulsifying chamber by diverting the mixture, which impacts the trap essentially in the primary flow direction, essentially counter to the primary flow direction. The primary flow direction is defined by the nozzle arrangement of the vacuum chamber, which changes over into the emulsifying chamber downstream. The settling segment adjoins this specially-designed emulsifying chamber by way of an outlet in the floor of the emulsifying chamber. The settling segment having the outlet can be embodied simply as a throughgoing bore.

An additional advantage of this device is its compact design.

For the basic inventive embodiment of the emulsifying chamber, it suffices to provide two segments that follow one after the other in the primary flow direction, with the first segment widening step-wise relative to an outlet of the vacuum chamber, and the second segment having a cross section that is widened, step-wise, relative to the first segment, in connection with the flow trap in the floor, i.e., the downstream end of the emulsifying chamber.

A significantly better option for attaining the desired fine-pored emulsion, according to a modification of the basic

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embodiment, is for the emulsion chamber to comprise three segments, whose cross sections widen, step-wise, relative to the cross section of the outlet of the vacuum chamber or the upstream adjacent segment. The flow trap is provided in the floor of the emulsifying chamber in this case as well.

According to a feature of the invention, the flow trap is embodied or formed as a blind ring having an annular trough that is open counter to the primary flow direction of the steam-milk-air mixture. The trough is embodied and oriented such that it diverts the steam-milk-air mixture, which impacts it essentially in the primary flow direction, essentially counter to the primary flow direction. This swirls the mixture again and keeps it in the emulsifying chamber longer.

In a further modification of the basic invention, a flow-diverting unit is disposed in the emulsifying chamber, at a distance from the floor. This unit is embodied such that the flow of the steam-milk-air mixture is diverted essentially counter to its primary flow direction. This flow diversion, again, effects a desired swirling of the flowing mixture in addition to the swirling effected by the flow trap that is always provided in the floor of the emulsifying chamber in accordance with the invention.

According to a preferred feature of the last mentioned embodiment, the flow-diverting unit can advantageously be embodied with an open, annular trough that surrounds a central, essentially conical protrusion. This trough can be embodied similarly to, but flatter than, the annular, open trough of the flow trap in the floor.

According to a feature of the invention, the flow-diverting unit is advantageously held in the emulsifying chamber, at a distance from the inside wall of the chamber, by radial ribs, so the flow can occur in the primary flow direction in the region of the inside wall.

In a variation of the device of the invention, the emulsifying chamber has diaphragms at the steps between its segments, with the diaphragms additionally narrowing the adjacent, smaller cross section. These diaphragms or narrow points form pronounced, turbulence-inducing edges that effect an even more vigorous swirling of the steam-milk-air mixture than the steps of the cross sections themselves.

Particularly for better cleaning, but also for the uncomplicated production of the emulsifying chamber and the adjacent regions, the emulsifying chamber has individual elements, which are cylindrical on the outside and are formed out with at least one of the stepped cross sections on the inside, and are held together by a common sleeve. All of the elements are disposed concentrically in the sleeve, which has a smooth outside surface.

According to a feature of the invention, the elements of the emulsifying chamber can comprise a half-hard synthetic material, notably chloroprene caoutchouc (brand name "Neopren"). This synthetic material also has a sufficient dimensional stability when exposed to steam.

In accordance with a combination feature of the device of the invention, a premixing chamber is preferably disposed between the vacuum chamber and the milk supply line; the air conduit terminates into this chamber. This assures the homogeneous air distribution of the emulsion, namely the entry of a thoroughly premixed milk-air mixture into the vacuum chamber before steam is added to the mixture and the additional swirling takes place in the emulsifying chamber.

Three variations of the invention are explained below by way of exemplary embodiments, with reference to the four drawing figures.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal section through the first variation of the device according to the invention.

FIG. 2 is a longitudinal section through the second variation of the device according to the invention.

FIG. 3 is a cross section of the second variation of the invention, in the plane III—III in FIG. 2.

FIG. 4 is a longitudinal section through a third variation of the device according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In all of the figures, corresponding parts are provided with the same reference characters.

The longitudinal sections all lie in a plane that extends vertically in the working position. All of the variations according to FIGS. 1 through 4 include a nozzle arrangement 1, 2 with a vacuum chamber 3. The nozzle arrangement 1, 2 is connected to a steam supply line 4, which is fed by a steam generator, of an espresso machine. The vacuum chamber 3 is connected by way of a flow-quantity-limiting element 5 to a milk supply line 6, which originates from an external milk container. A premixing chamber 7, into which an air conduit 8 terminates, is formed between the vacuum chamber and the flow-quantity-limiting element 5, on an end face of a cylindrical shoulder 21 of the limiting element.

At its downstream end, the vacuum chamber 3 changes over into a bore 3a, which leads to an emulsifying chamber 9. An arrow 10 indicates the primary flow direction. The cross section-length ratio of the bore is essentially closer to 1 than 1:10, as can be seen from the drawing.

The bore 3a extends into a first segment 11 of the emulsifying chamber having a relatively small clearance cross section or diameter. The bore is disposed coaxially with respect to the nozzle arrangement 1, 2. In the downstream direction, at a step 12, the first segment 11 changes over to a second, concentric segment 13 of the emulsifying chamber 9, the second segment 13 having a larger cross-sectional surface or larger diameter downstream of the step 12. The lengths of the first segment 11 and the second segment 13 in the primary flow direction 10 can be larger than the diameters of these segments, but the ratio of the segment length to their diameter is considerably smaller than in a settling segment 16, where the ratio is typically 10:1. The inside walls 14, 15 of the first segment 11 and the second segment 13, respectively, have no air-intake openings.

A bore acting as a settling segment 16 is seated concentrically in a floor or bottom 15a of the second segment 13 of the emulsifying chamber 9. The bore of the settling segment 16 is surrounded by a blind ring 17 as a flow trap. As can be seen in detail in FIG. 1, the trap 17 is embodied i.e. formed, as an annular trough that is open toward the top, counter to the primary flow direction 10.

The first segment 11 of the emulsifying chamber 9 is formed out of the element 2 of the nozzle arrangement, while an additional element 18, which is shaped approximately like a hollow cylinder with a floor, includes the second segment 13 of the emulsifying chamber 9, the settling segment 16 in the floor 15a and the blind ring 17 surrounding the settling segment. For cleaning purposes, the element 2 and the additional element 18 are detachably held together by a sleeve 19. An O-ring 22 provides a seal between the elements 1 and 2 of the nozzle arrangement, one of which is inserted into the other.

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The reference numeral 20 indicates a handle, which can be used to grasp the flow-quantity-limiting element 5 in order to insert it into or remove it from a receptacle of the nozzle arrangement.

When the milk supply line 6 is connected to a milk container, and steam flows into the nozzle arrangement 1, 2 by way of the steam supply line 4, milk and air are suctioned into the premixing chamber 7 by the vacuum created in the vacuum chamber 3, and premixed there. This air-milk mixture flows into the vacuum chamber 3, in which steam is added to the mixture. The resulting steam-air-milk mixture flows, via the outlet or bore 3a into the first segment 11 of the emulsifying chamber 9 downstream of the vacuum chamber 3. A step, at which the mixture is additionally swirled, is formed between the bore 3a and the first segment 11 having a larger cross-sectional surface than the bore 3a. When the mixture exits the first segment 11 of the emulsifying chamber 9 via the step 12 and enters the second segment 13 of the emulsifying chamber 9, a new, additional swirling is effected under the continuous influence of the steam energy. Because of the embodiment of the floor region of the second segment 13 of the emulsifying chamber 9, the steam-milk-air mixture additionally swirled and emulsified in this manner remains in the chamber 9 significantly longer than with a floor 15a having one or more simple outlets. Here, the outlet formed in the floor by the bore of the settling segment 16 is surrounded by the blind ring 17, which represents a discharge trap, through which the mixture is conducted away from the outlet into the interior of the second segment 13 of the emulsifying chamber, where the mixture is re-swirled and thoroughly mixed with the steam-milk-air mixture flowing into the second segment.

The premixed steam-milk-air mixture entering the emulsifying chamber is intensively mixed and swirled multiple times in the emulsifying chamber before it can leave the chamber as a fine-pored emulsion.

The variation of the device according to FIGS. 2 and 3 differs from the above-described first variation in that an additional flow-diverting unit 25 is disposed in the emulsifying chamber generally represented by 23, specifically in the second segment 24 having a larger free cross section at the step 12 than the first segment 11. This additional unit 25 is a component of an additional element 26, and is located at its downstream end. The unit 25 includes an annular trough, which is open toward the top and surrounds an essentially conical protrusion—FIG. 2—and diverts the steam-milk-air mixture flowing into the second segment of the emulsifying chamber 23 essentially upward, similarly to the blind ring 10 in the floury for effecting an additional swirling and thorough mixing before the steam-milk-air mixture can flow into the space directly above the blind ring 17, and then into the settling segment 16. For assuring this flow, radial ribs 27–29 are formed out between the flow-diverting unit 25 and an inside wall 30 of the element 26, as can be seen in FIG. 3 in connection with FIG. 2.

In this case, the second segment 24 of the emulsifying chamber 23 is not only formed by the additional element 26, but by a further additional element 31, which, includes the settling segment 16 and the blind ring 17. The elements 2, 26 and 31 are, again, held together in a concentric arrangement by the sleeve 19.

When seen in the flow direction 10, the third variation of the device, illustrated in FIG. 4, corresponds to the first and second variations, up to and including the first segment 11 of the emulsifying chamber represented in its entirety by 32.

In the third variation, a second segment 33 and a third segment 34 adjoin the first segment 11 of the emulsifying

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chamber 32. The second segment 33 and the third segment 34 are formed out of a one-piece, additional element 35. The first segment 11, the second segment 33 and the third segment 34 of the emulsifying chamber 32 follow one after the other in the primary flow direction 10, with each having a dramatically larger free cross-sectional surface than the last segment. Instead of the steps formed between the segments, in this case round diaphragms 36, 37 are formed out. The diaphragms 36, 37 have smaller cross sections than the adjacent segments, and thus constitute turbulence-inducing edges that project into the flow path of the steam-milk-air mixture and create more intense swirling than the steps of the first and second variations. The swirling is thus enhanced by the three cascading segments 11, 33, 34 whose diameters increase step-wise in the primary flow direction. The three segments are so short in the flow direction 10 that the swirling action is activated by the continuously flowing steam energy, and no settling occurs. The fine-pored, emulsified steam-milk-air mixture flowing through the settling segment 16 in the floor of the element 35 does not settle until it has negotiated the flow trap formed by the blind ring 17.

What is claimed is:

1. A device for producing milk froth for cappuccino, comprising:

- a nozzle arrangement having a first inlet for connection to the output of a steam pipe and having a vacuum chamber with a second inlet for connection to a milk supply line;
- an air conduit connected to the second inlet upstream of the vacuum chamber, whereby an air/milk mixture is supplied to the vacuum chamber;
- an emulsifying chamber connected to the outlet of the vacuum chamber and having a chamber wall, a floor with a central, flow-diverting protrusion and an outlet; and
- a settling segment adjoining the outlet; and,

wherein the emulsifying chamber is formed without separate air inlets and has at least two free cross sections that widen step-wise in the primary flow direction, and the central, flow-diverting protrusion is formed as a flow trap that surrounds the outlet in the floor such that the protrusion diverts a mixture flowing essentially in the primary flow direction essentially to a direction counter to the primary flow direction.

2. The device according to claim 1, wherein the emulsifying chamber has three free cross sections that widen step-wise in the primary flow direction.

3. The device according to claim 1, wherein in the emulsifying chamber, a flow-diverting unit is disposed at a distance from the floor the unit being shaped so as to effect a flow diversion essentially counter to the primary flow direction of the mixture.

4. The device according to claim 3, characterized in that the flow-diverting unit (25) is embodied with an annular, open trough that surrounds a central, essentially conical protrusion.

5. The device according to claim 3, wherein the flow-diverting unit is held in the emulsifying chamber at a distance from the inside chamber wall, by radial ribs.

6. The device according to claim 1, wherein the emulsifying chamber has diaphragms at steps between the step-wise widened free cross sections, with the diaphragms additionally reducing the adjacent, smaller cross section at one of the steps.

7. The device according to claim 1, wherein the emulsifying chamber is formed of individual elements that are

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essentially cylindrical on the outside, are formed with at least one of the stepped cross sections on the inside, and are held together by a common sleeve.

8. The device according to claim 7, wherein the half-hard synthetic material is chloroprene caoutchouc.

9. The device according to claim 7, wherein the elements of the emulsifying chamber comprise a half-hard synthetic material.

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10. The device according to claim 1, wherein a premixing chamber is disposed between the vacuum chamber and the second inlet for milk supply line with the air conduit terminating into the premixing chamber.

11. The device according to claim 8, wherein the flow trap is formed as a blind ring.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,499,389 B1
DATED : December 31, 2002
INVENTOR(S) : Emanuel Probst

Page 1 of 1

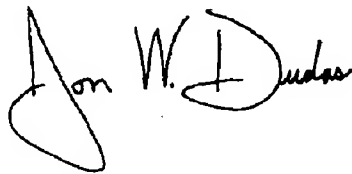
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page.

Item [73], Assignee, delete "Elektroapparate" and insert -- Elektroapparate --; and after "Niederbuchsiten" insert -- Switzerland --.

Signed and Sealed this

First Day of June, 2004

A handwritten signature in black ink, appearing to read "Jon W. Dudas", written over a horizontal line.

JON W. DUDAS
Acting Director of the United States Patent and Trademark Office

EXHIBIT D



US005768981A

United States Patent [19]

Cicchetti

[11] Patent Number: 5,768,981

[45] Date of Patent: Jun. 23, 1998

[54] **STERILIZABLE STEAM HEATING DEVICE**

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[73] Assignee: Quick Italia S.r.l., Cesano Maderno, Italy

[21] Appl. No.: 834,388

[22] Filed: Apr. 16, 1997

[30] **Foreign Application Priority Data**

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[51] Int. Cl.⁶ A47J 31/40; A47J 31/46; A23C 9/00; A23L 2/26

[52] U.S. Cl. 99/453; 99/275; 99/293; 99/452; 99/323.1

[58] Field of Search 99/452-454, 275-279, 99/323.1-323.3, 281-286, 289 R, 291, 293-295, 300, 302 R; 261/78.1, DIG. 16, DIG. 76, 124, 142; 426/477

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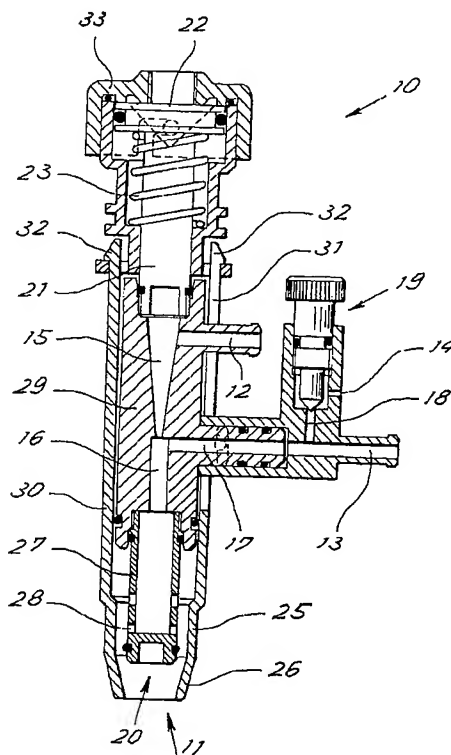
Primary Examiner—Timothy F. Simone

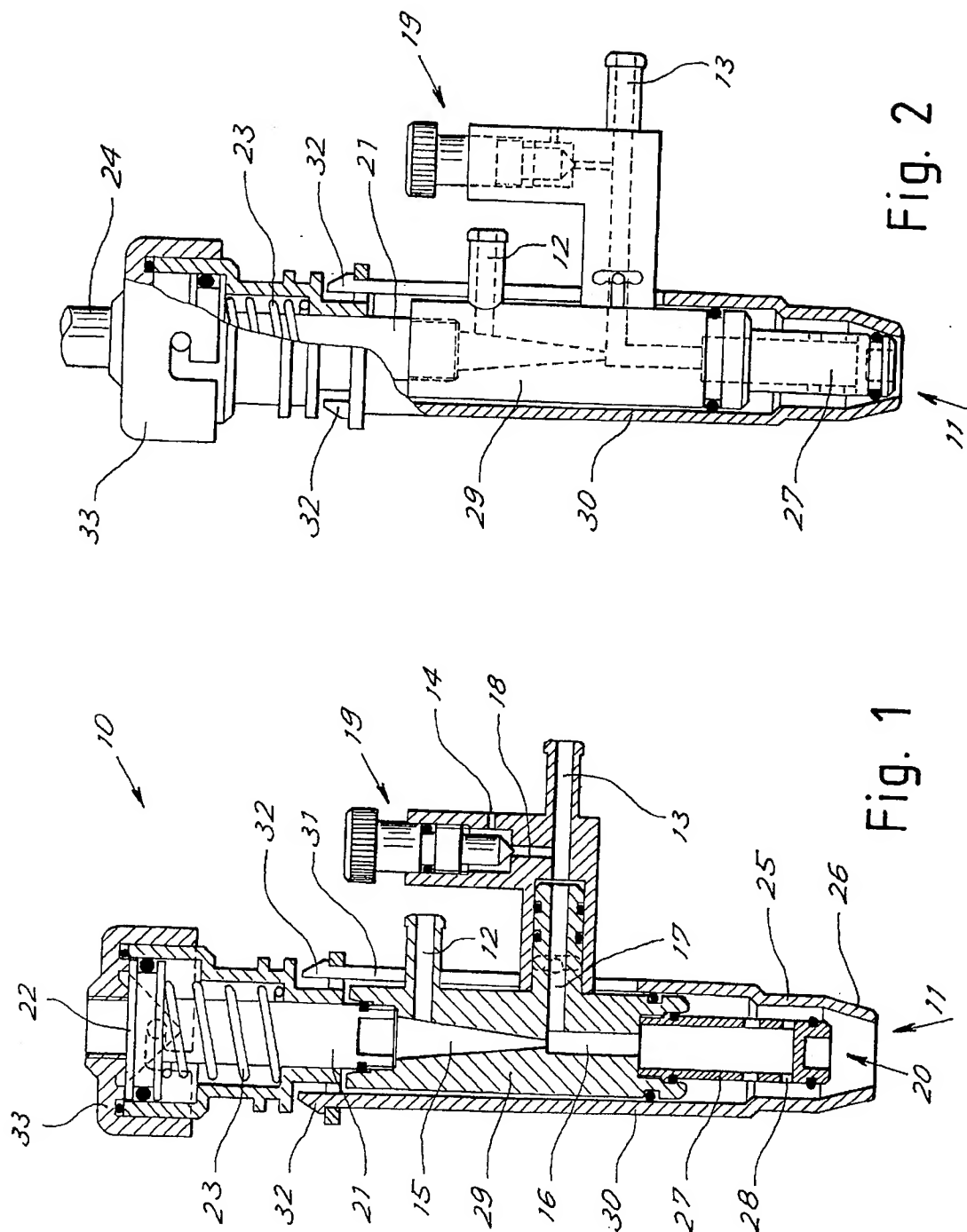
Attorney, Agent, or Firm—Jacobson, Price, Holman & Stern, PLLC

[57] **ABSTRACT**

A device (10) for producing a heated milk-air emulsion comprises, at the inside thereof, circulation paths for steam, milk and air towards a delivery outlet (11). A blocking means (20) is drivingly slidable to close the delivery outlet (11) and thereby enable execution of an inner-cleaning cycle in the device on activation of steam circulation. Advantageously, the delivery outlet (11) is formed of a duct (25) the free end (26) of which is of tapered shape. Axially disposed inside duct (25) is a dispenser (27) at which the circulation paths arrive and which has radial passageways (28) opening into the duct (25). For accomplishment of the blocking means, the duct and dispenser are axially slidable relative to each other to bring the dispenser (27) to a sealing contact position against the duct (25) thereby closing passage of same to the outside.

8 Claims, 1 Drawing Sheet





STERILIZABLE STEAM HEATING DEVICE

FIELD OF THE INVENTION

The present invention relates to an steam heating and/or emulsifier device for milk (like as a "cappuccino-making" device) or other beverages.

BACKGROUND OF THE INVENTION

A problem arises in such devices in that cleaning operations are of difficult accomplishment. Actually, the small inner ducts, often inaccessible, can easily become a breeding-ground for moulds and bacteria, or in any case can house deposits that are to be eliminated. It has been proposed that the same steam used for heating and/or generating the heated emulsion should be also employed for cleaning and sterilizing all the device ducts at high temperature. In the devices of the known art however, operations to be executed for steam-cleaning and sterilization are relatively complicated and can cause faults.

The general object of the present invention is to obviate the drawbacks of the known art by providing a steam heating device which enables an easy and safe steam-cleaning.

SUMMARY OF THE INVENTION

In view of the above object, in accordance with the invention, a steam heating device for producing a heated (beverage) has been conceived which is provided at the inside thereof with paths enabling steam and beverage, to circulate to a delivery outlet, characterized in that it comprises drivingly slidable blocking members for closing the delivery outlet, so that an inner-cleaning cycle may be performed on operation of the steam circulation.

BRIEF DESCRIPTION OF THE DRAWINGS

For better explaining the innovatory principles of the present invention and the advantages it offers over the known art, a possible embodiment of same applying said innovatory principles will be disclosed hereinafter, by way of non-limiting example, with the aid of the accompanying drawings. In the drawings:

FIG. 1 is a longitudinal sectional view of a device in accordance with the invention, at a first position of normal operation;

FIG. 2 is a partly sectioned longitudinal view of the device in FIG. 1, at a second position for cleaning.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings, a steam heating device 10, that is a device for producing a heated beverage or a milk-air emulsion, is internally comprised of circulation and mixing paths for steam, beverage and, if required, air to a delivery outlet 11.

The device 10 comprises a steam-flow inlet 12, a beverage-admission inlet 13 and an air inlet 14. For example, the beverage is milk. The circulation paths comprise an axial chamber 15 into which steam from inlet 12 is introduced. Chamber 15 tapers for opening into a chamber 16 of greater diameter at the radial arrival point of a duct 17 connected to the milk inlet 13. In this way, the steam flow entering the chamber of greater diameter 16 sucks the milk from the milk-supply duct. Radially opening into the milk-supply duct 17 is a duct 18 for air admission from inlet 14. On passage of the milk flow along duct 17, air is drawn in

from duct 18. In this manner air is emulsified with milk. A needle valve 19 is located along the air duct for regulating the amount of sucked air in the milk-supply duct.

A substantially known art has been hitherto described. In accordance with the invention, the device 10 comprises blocking means 20 that is drivingly slidable for closing the delivery outlet 11. The blocking means is controlled by an actuator 21. Actuator 21 can be of a mechanical, electric, pneumatic, etc. type. For example, it could consist either of a mere pushbutton to be operated manually, or of a plunger 22 that, against the action of a spring 23, moves the blocking means. Advantageously, the plunger can be operated by a steam flow reaching the device through a duct 24.

Advantageously, the delivery outlet 11 is made up of a duct 25 the free end 26 of which is of tapered conformation. Axially disposed within duct 25 is a dispenser 27 to which the circulation passageways through chamber 16 come. Dispenser 27 has radial passageways 28 opening into duct 25.

As shown in FIG. 1, when the device is in a normal operating condition, an annular passageway is defined between the duct 25 and dispenser 27 for drivingly emitting the emulsion from outlet 11. As shown in FIG. 2, duct 25 and dispenser 27 are axially slidable relative to each other so that, on the actuator operation, the dispenser is biased into sealing contact against the inner tapered portion 26 of the duct, thereby closing passage to the outside and embodying the outlet blocking means.

Advantageously, the dispenser moves integrally with a body 29 of the device inside which the circulation passageways are formed, whereas the tapered duct 25 extends rearwardly to form a chamber or sliding casing 30 slidably receiving an axial portion of said body. Ducts 12 and 13 and the valve unit 19 project from the casing 30 through a side slit 31. The actuator body is snap-fastened to the casing 30 by means of locking tabs 32.

Still advantageously, the valve unit 19 together with the starting portion of duct 17, can be bayonet-disconnected from body 29, in addition to partly rotating about the axis of duct 17.

At this point it is apparent that the intended purposes have been achieved. In normal operating conditions, the device is as shown in FIG. 1, so that it is sufficient to send steam to inlet 12 to enable the heated emulsion to come out of the outlet 11, as in the known art. When an inner-cleaning cycle is desired, operation of the actuator is sufficient, in order that the blocking means may close the outlet 11 as shown in FIG. 2. By sending steam to inlet 12, a steam circulation occurs that moves up along the ducts located inside the device and sterilizes them.

In any case, as clearly viewed from the figures, the described device can be easily disassembled should a thorough cleaning be required. Actually, removal of the upper bayonet-fastened plug 33 is sufficient to enable the whole inner set to be taken out, which set can be further dismantled into its individual components. Obviously, the above description of an embodiment applying the innovatory principles of the present invention is for purposes of illustration only and is not to be interpreted as a limitation of the scope of the invention as herein claimed.

For example the shape of the inner device ducts can be different from that herein shown.

The needle valve can be omitted or completely closed. In this manner, the device became a steam heating device without emulsifier. The heating device can be used for heating milk, coffee, chocolate, etc.

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What is claimed is:

1. A steam heating device for producing a heated beverage, said steam heating device comprising:

internal circulation paths for steam and beverage to circulate towards a delivery outlet, and

drivingly slidable blocking means for closing the delivery outlet, so that an inner-cleaning cycle may be performed on operation of steam circulation.

2. A device according to claim 1, wherein the delivery outlet consists of a duct a free end of which is of tapered shape, and inside of said duct a dispenser being axially disposed at which said circulation paths arrive and which is provided with radial passageways opening into the duct, which dispenser and duct are axially slidable relative to each other, so as to bring the dispenser to a sealing contact position against the duct and to close passage of same to the external environment, thus embodying said outlet blocking means.

3. A device according to claim 1, wherein the dispenser is slidably moved to a contact position with the duct, against action of a spring, by means of an actuator coaxial with the dispenser.

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4. A device according to claim 1, wherein the dispenser moves integrally with a body of the device inside which said circulation paths are located.

5. A device according to claim 4, wherein the tapered duct extends rearwardly to slidably receive an axial portion of said body.

6. A device according to claim 1, wherein the circulation paths are comprised of a steam-receiving axial chamber which tapers for opening into a chamber of greater diameter at a radial arrival point of a duct for beverage supply, steam flow entering the chamber of greater diameter and sucking beverage from the beverage-supply duct, a duct for air admission radially opening into the beverage-supply duct for emulsifying the beverage.

7. A device according to claim 6, wherein the air-admission duct is provided with a needle valve for regulating the air amount drawn into the beverage-supply duct.

8. A device according to claim 3, wherein the actuator is embodied by a plunger operated by a steam flow.

* * * * *